

of the system being checked. The analyzer flows and bypass flows may be used to estimate the in-use flow rates.

(3) The sample probe and the connection between the sample probe and valve V2 (see Figure 1 in appendix B of this subpart) may be excluded from the leak check.

(b) *Pressure side leak check.* The maximum allowable leakage rate on the pressure side is 5 percent of the in-use flow rate.

(c) The response time shall be accounted for in all emission measurement and calculations.

**§ 89.317-96 NO<sub>x</sub> converter check.**

(a) Prior to its introduction into service, and monthly thereafter, the chemiluminescent oxides of nitrogen analyzer shall be checked for NO<sub>2</sub> to NO converter efficiency. Figure 2 in appendix B of this subpart is a reference for the following paragraphs.

(b) Follow good engineering practices for instrument start-up and operation. Adjust the analyzer to optimize performance.

(c) Zero the oxides of nitrogen analyzer with zero-grade air or zero-grade nitrogen.

(d) Connect the outlet of the NO<sub>x</sub> generator to the sample inlet of the oxides of nitrogen analyzer which has been set to the most common operating range.

(e) Introduce into the NO<sub>x</sub> generator analyzer-system an NO-in-nitrogen (N<sub>2</sub>) mixture with an NO concentration equal to approximately 80 percent of the most common operating range. The

NO<sub>2</sub> content of the gas mixture shall be less than 5 percent of the NO concentration.

(f) With the oxides of nitrogen analyzer in the NO mode, record the concentration of NO indicated by the analyzer.

(g) Turn on the NO<sub>x</sub> generator O<sub>2</sub> (or air) supply and adjust the O<sub>2</sub> (or air) flow rate so that the NO indicated by the analyzer is about 10 percent less than indicated in paragraph (b)(5) of this section. Record the concentration of NO in this NO+O<sub>2</sub> mixture.

(h) Switch the NO<sub>x</sub> generator to the generation mode and adjust the generation rate so that the NO measured on the analyzer is 20 percent of that measured in paragraph (b)(5) of this section. There must be at least 10 percent unreacted NO at this point. Record the concentration of residual NO.

(i) Switch the oxides of nitrogen analyzer to the NO<sub>x</sub> mode and measure total NO<sub>x</sub>. Record this value.

(j) Switch off the NO<sub>x</sub> generator but maintain gas flow through the system. The oxides of nitrogen analyzer will indicate the NO<sub>x</sub> in the NO+O<sub>2</sub> mixture. Record this value.

(k) Turn off the NO<sub>x</sub> generator O<sub>2</sub> (or air) supply. The analyzer will now indicate the NO<sub>x</sub> in the original NO-in-N<sub>2</sub> mixture. This value should be no more than 5 percent above the value indicated in paragraph (b)(4) of this section.

(l) Calculate the efficiency of the NO<sub>x</sub> converter by substituting the concentrations obtained into the following equation:

$$\text{percent efficiency} = \left( 1 + \frac{a-b}{c-d} \right) \times 100$$

Where:

*a*=concentration obtained in paragraph (i),

*b*=concentration obtained in paragraph (j),

*c*=concentration obtained in paragraph (g),

*d*=concentration obtained in paragraph (h).

If converter efficiency is not greater than 90 percent, corrective action will be required.

**§ 89.318-96 Analyzer interference checks.**

(a) Gases present in the exhaust other than the one being analyzed can interfere with the reading in several ways. Positive interference occurs in